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FARMING IN THE BLUEGRASS REGION.

A Study of the Organization and Management of 178 Farms in Central Kentucky.

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INTRODUCTION.

The purpose of this bulletin is to present a general description of the farm-management practices followed on farms in the bluegrass region of Kentucky and to determine from analyses of the operations on about two hundred such farms the relative efficiency of the different types of farming in vogue and the factors which seem to have the greatest influence on farm profits in that locality.

It was found that specialized farms, those of the tobacco, stock, or dairy type, moderately diversified, are the most efficient in this region and that the general mixed farms, more highly diversified, are the least efficient. Thus, while diversity has a vital relation to profits here as elsewhere, it would appear that in the bluegrass region these specialized farms have found in moderate diversity the right degree for maximum profit.

Of the factors which determine profit, size of business was found to have the greatest weight, with utilization of pasture and yield of

field crops per acre important secondary factors. Size of farm has here no direct bearing upon labor income. It does, however, determine the character of the farm organization, the small farms naturally turning more to the cultivation of tobacco and the large farms to grazing.

METHOD OF STUDY.

The farms selected to furnish the basis of study are located in three counties—Mason, Scott, and Madison. These counties are typical of the different parts of the region. They are widely separated. Mason lies on the Ohio River, Scott is near the center of the region, while Madison lies at the foot of the mountains and is representative of the more distinctly stock type of farming. Tobacco and live stock are important enterprises in all the counties studied. These two enterprises furnish the bases of all the types of farming found, with the exception of 10 distinctly dairy farms, which have not been included in the general analysis.

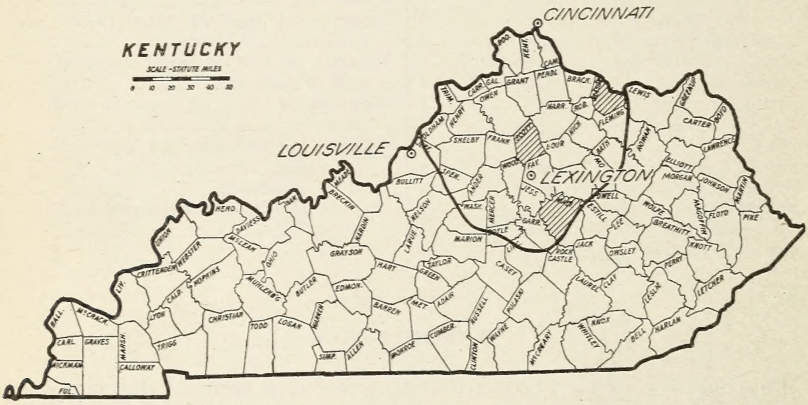

FIG. 1.—Map of Kentucky with bluegrass area outlined and the three counties in which farm records were taken shaded.

The farms visited were those named by various men in the community as being operated on a business basis. It was thought advisable also to select such farmers as were both willing and competent to give a record of a year's business, March 1, 1913, to March 1, 1914. Many of the farms were visited twice and many three times. In a preliminary survey about 25 complete records of each enterprise in the county were taken in order to determine the average seasons in which various operations were carried on and the amount of labor and horse work required for each. At the same time, farmers' estimates were secured as to the number of days available for field work in each month of the year. In the general survey that followed, each farmer furnished a year's record of his business and such other

data as would be necessary in making a complete analysis of the business organization of the farm.[1]

GENERAL DESCRIPTION OF REGION.

The bluegrass region borders on the Ohio River and occupies a somewhat circular area about 100 miles in diameter. (See fig. 1.) It is bounded by a rim of low mountains and the Ohio River. Lexington, a city of about 40,000, is southeast of the center. Richmond, Winchester, Paris, Georgetown, Versailles, and Nicholasville are the county seats of adjoining counties. All of these, except Richmond and Winchester, are connected with Lexington by trolley. Frankfort, the capital of the State, 22 miles west, is also connected with Lexington by trolley. All towns of importance throughout the region are connected by steam railways.

Throughout the region connecting the main towns and villages are macadamized roads, many of them kept in excellent repair.

Three main railway systems center at Lexington, connecting with the main large market centers of the interior and with all large seaboard cities on the Atlantic and the Gulf of Mexico.

The Kentucky River rises in the mountains of the southeastern part of the State and takes a winding course through the central portion of the area. Small steamers and rafts ply this river throughout its course in this region.

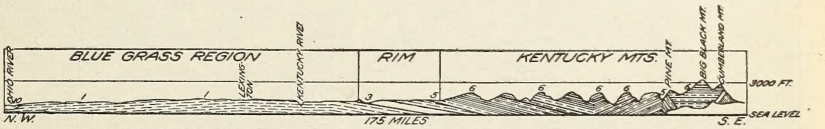

FIG. 2.—Cross-section of Kentucky including the bluegrass region, indicating the topography and the elevations above sea level.

The topography in most parts, except in the vicinity of streams, is gently rolling. (See fig. 2.) The area is largely cleared of forest trees and 85 to 90 per cent is tillable. Farms vary in size from 40 to 1,000 acres or more. The country generally looks prosperous. Most farms are well kept up and many farmsteads have luxurious appointments and surroundings. (See fig. 3.) Formerly, the plantation type of farm prevailed and the work was almost entirely done by slaves. There is now a tendency toward subdivision into smaller farms. However, many are still large and are run on the plantation plan, with hired laborers or share tenants, mostly colored, who live on the farm in cottages and are provided with gardens and a few other perquisites.

[1] Acknowledgment is due Messrs. B. F. Creech, Will D. Click, William Ballinger, L. C. Caldwell, and A. B. Thomas for collecting data for this bulletin; also to Prof. J. S. Pullen, of the Eastern Kentucky Normal School, who assisted in collecting data in Madison County and gave valuable help in other ways. The cordial interest of the farmers who gave the records is much appreciated, and thanks are due them for the time given to this work.

Many of the people who settled in this region brought with them from Virginia, and a few from the Carolinas, the fine traditions of the country house and the gentleman farmer. They had the same interests in the breeding of high quality of live stock which has long characterized the English farmers. Many dwellings were built in a substantial manner, often of brick. (See fig. 4.) Most of these still stand and give the country an atmosphere of ease, comfort, and sometimes luxury.

A great many of the farms are still owned and operated by those who inherited them from the original owners. There is reason to believe that the present owners are farming in the same spirit as their ancestors and with as good success.

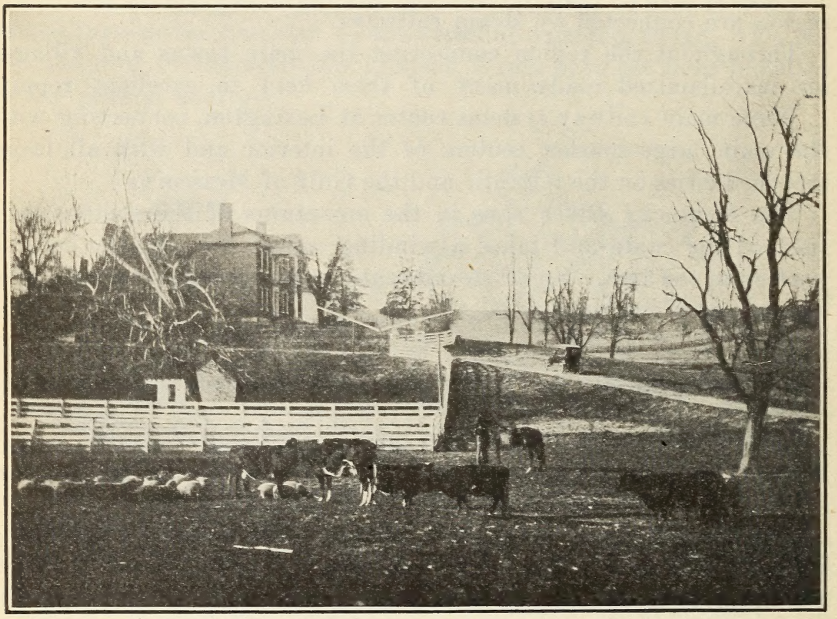

FIG. 3.—A typical bluegrass farmstead.

A few tracts have been bought up and are operated on a showy and expensive scale, with probably very little, if any, profit to the owners.

Tobacco culture enables the small-sized farm to carry a comparatively large business, so that there are many prosperous farms 40 to 100 acres in size.

In traveling through the country for the first time one is impressed by the large proportion of farm area in bluegrass pasture. Over the fields are scattered fine forest trees, providing shade for stock. These large areas in pasture and scattered trees suggest that the farmers devote their attention largely to live stock. The bluegrass

farmer is prejudiced in favor of live-stock farming and will cling to it as a type as long as he can. Next to live stock in importance is the white Burley tobacco, a crop well adapted to the region, so that these two enterprises characterize this section agriculturally and are at present the main sources of income.

HISTORY OF BLUEGRASS FARM ENTERPRISES.

It is a well-known fact that the acreage of crops varies from year to year because of the variation in prices. The amount of live stock kept on farms varies also for the same reason. Prices for a product in one section are, as a rule, made permanently lower than the cost of production if the same can be produced in another section at a

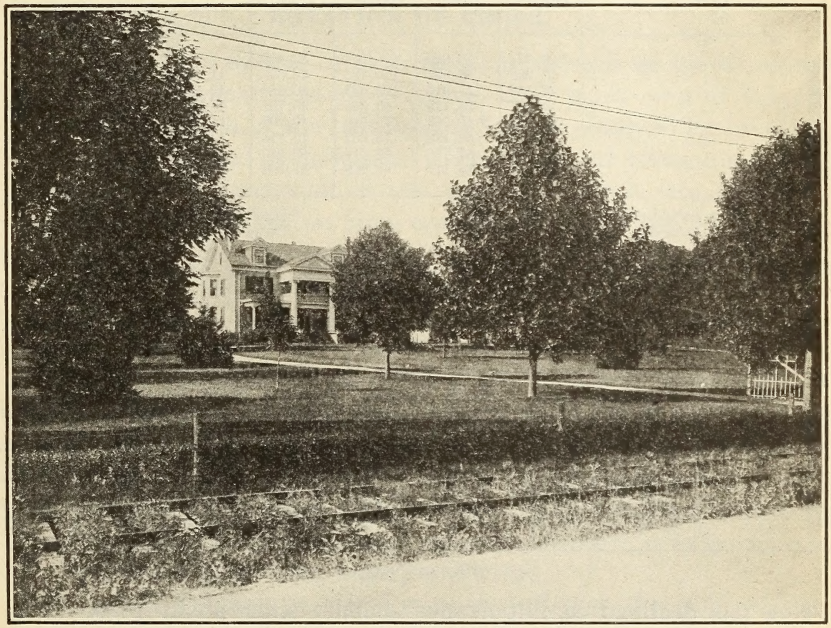

FIG. 4.—Type of the large modern farm house.

lower cost and in adequate quantities. Again, by experience or through discovery, a more profitable enterprise may be substituted for another. Any of these causes or a combination of them will result in relatively permanent changes in the agriculture of a region. Tables I and II give a history of the several enterprises developed in this region from 1840 to 1910 according to figures of the United States census. These figures show that the agricultural resources here were well developed as early as 1840 and that their total production was not far behind that of 1910. Changes in the relative importance of the several enterprises, however, have occurred. Swine, for instance, were much more important prior to 1860 than at

any time since. Before this time large droves of hogs were taken across the mountains into those sections of Georgia and the Carolinas which were devoted to raising cotton. This fact no doubt largely accounts for the comparatively large number of swine at that time. The development of railways and the opening up of the rich corn States farther west and north has also had an influence in changing the status of this enterprise. About the same amount of corn is raised as formerly, but most of it is fed to beef cattle and comparatively little to hogs.

TABLE I.—*Live-stock enterprises in the bluegrass region of Kentucky, 1840–1910 (Madison, Mason, and Scott Counties).*

Year.	Horses.	Sheep.	Swine.	Total cattle.	Milch cows.	Other cattle.	Working oxen.[1]
1840	[2] 23,704	59,926	116,244	33,419	.....	.....	.....
1850	17,292	58,327	115,122	38,836	11,568	27,268	3,288
1860	22,160	37,916	103,553	40,385	12,585	27,800	4,156
1870	14,817	25,179	65,095	35,761	10,504	25,257	2,624
1880	16,528	[3] 45,753	75,980	40,207	11,495	28,712	1,598
1890	20,074	67,439	75,662	45,810	12,266	33,544	1,374
1900	18,721	87,778	62,476	59,989	[4] 12,215	47,774	.....
1910	19,193	88,177	63,969	47,591	[4] 13,054	34,537	.....

[1] Included under "Other cattle."
[2] Includes mules.
[3] Exclusive of lambs.
[4] Dairy cows.

TABLE II.—*Field crop enterprises in the bluegrass region of Kentucky, 1840–1910 (Madison, Mason, and Scott Counties).*

Year.	Corn.	Wheat.	Rye.	Barley.	Oats.	Hay.	Hemp.	Tobacco.
	Bushels.	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Tons.*	*Pounds.*	*Pounds.*
1840	2,230,880	367,668	178,092	8,000	347,941	9,670	2,356	1,248,032
1850	3,492,435	135,125	35,759	71,827	383,004	9,121	3,471	2,553,333
1860	3,536,996	541,304	99,094	77,291	388,390	9,639	528	1,804,593
1870	2,453,681	174,469	130,495	43,364	209,394	9,794	1,549	1,642,656
1880	3,123,212	837,172	71,454	81,663	98,014	7,980	348	6,452,093
1890	3,593,338	708,740	43,648	15,745	225,102	28,762	853	7,185,519
1900	2,754,770	702,240	17,100	728	66,730	[1] 33,315	283,090	16,794,630
1910	3,475,775	332,181	21,941	2,710	63,058	41,821	342,450	23,688,291

[1] Hay and forage.

Rye has declined in importance sharply since about 1870. This crop is no longer profitable, except for early spring pasture and to turn under.

Barley also has declined in importance since about 1880, many farmers having forgotten that it was ever raised here.

Only about one-sixth as much oats is now raised as during the period before 1860. This crop also is unprofitable because it is produced in the States north and west at a very much lower cost per bushel than here. Most of the oats is now either cut and fed to horses in the bundle or is made into hay.

Tobacco has steadily increased in importance since about 1870 and is to-day one of the major enterprises. This is a crop that utilizes family labor to great advantage, and, as has been pointed out, is peculiarly adapted to the climate and soil.

Satisfactory historical figures on beef cattle and saddle horses can not be gleaned from census records, since cattle have been classified differently in the various census years. Beef cattle, though still numerous, are less important than formerly. About 1890 there was a dropping off not only in the number of beef cattle, but also in the number of all cattle. The saddle and driving horses of the bluegrass region have long been noted, but economic changes have occurred to make them less profitable. Mules, however, have largely filled up the ranks, so that to-day there are about the same number of animals of the horse kind as formerly. It is interesting to notice the gradual decline in the number of working oxen. Horses and mules have almost entirely taken the place of cattle as work stock.

ROTATION OF CROPS.

No well-defined system of crop rotation prevails in the bluegrass region. The common custom, however, is to plant corn or tobacco on sod land. Much of the best tobacco land is obtained by breaking up old bluegrass sod or new land. Two crops of tobacco are very seldom grown in succession on the same land, while two successive crops of corn are grown on from one-fourth to one-half of the corn area, the rest of the corn and tobacco being followed by a small-grain crop, usually wheat. Generally clover and timothy and occasionally bluegrass are sown with cereal crops. Hay is then cut usually 1 or 2 years.

The great irregularities in rotation are caused by the length of time the land remains seeded down. Occasionally a field will be sown to clover and turned again at the end of the year. If timothy or other grass seeds be sown the land may remain in grass several years, and if a good bluegrass sod develops it may remain in pasture 30 to 40 years. The more common practice, however, is to leave rotation crop land seeded down from 2 to 5 years.

The type of farming practiced seems to influence the crop rotation to some extent. On the tobacco farms corn follows corn least frequently, and the land seldom remains in grass more than 3 years. As the farms increase in size through the various types to the large stock farms with no tobacco, two crops of corn in succession will be raised on about 50 per cent of the corn land, and the time the land remains seeded down lengthens to from 3 to 6 years and frequently longer. The rotation period for the stock farms, therefore, generally ranges from 5 years to 9 or more years.

SOIL.

The soil of the bluegrass country is derived from limestone which is comparatively rich in lime phosphate. The typical bluegrass soil is reddish-brown or chocolate color. According to the United States

Bureau of Soils, it belongs to the series known as Hagerstown clay loam. It is of the same general type found in the Nashville Basin, East Tennessee Valley, and the Valley of Virginia. Except in the hilly parts along the rivers, rock is only occasionally seen on the surface. Generally it lies 2 to 20 feet below the surface, offering little obstruction to plows and other machinery. The subsoil in most places is a sticky red clay, highly retentive of moisture. While to the ordinary observer the soil seems quite uniform in fertility, the analyses by soil chemists show a good deal of variation, even in the most fertile sections.[1]

The farmers who have grown up in the region and have had experience with soils recognize many degrees of fertility. They distinguish the quality of tobacco soils especially by native trees that grow on the land. For instance, white oak, beech, walnut, maple, and hickory clearings have been favored for the production of the best quality of tobacco.[2]

CLIMATE.

The organization of crop enterprises is greatly influenced by climate. Figure 5 is a diagram showing the main facts about the climate of this section. The rainy season is during the winter, the

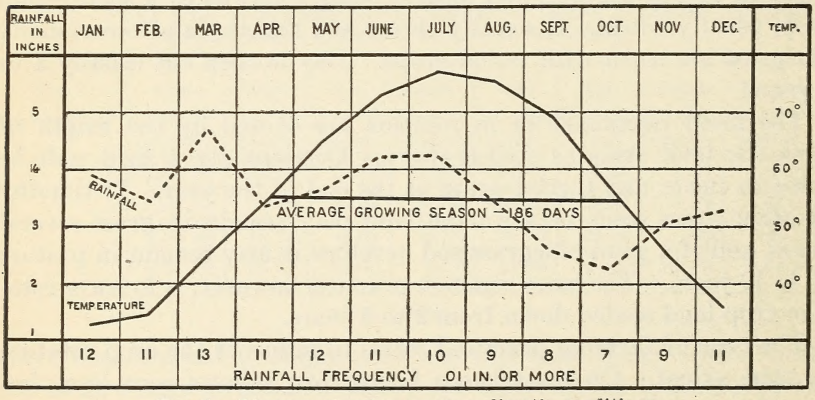

FIG. 5.—Diagram showing average climatic conditions.

highest average rainfall occurring in March. During the hot period of summer the average rainfall is sufficient on this type of soil to keep tilled crops growing vigorously, but if it were not for the fact of a deep, heavy clay loam, rich in phosphorus, the region undoubtedly would not be famous for bluegrass, since a relatively low rainfall during the summer and fall is in itself injurious to bluegrass pasture. The farmers here expect frequent dry spells, when there is a shortage of pasture and water, and have adapted their farm practice and systems of farming to these conditions. Tobacco is one of the best drought-resistant plants known. For stock water farmers

[1] See Kentucky Station Bulletin 162. [2] See Kentucky Station Bulletin 139.

depend mostly on ponds in which the surface water collects. These are usually natural depressions on the land surface, which are tramped nearly water-tight by the hoofs of animals. Wells are not reliable in this region as a source of water supply.

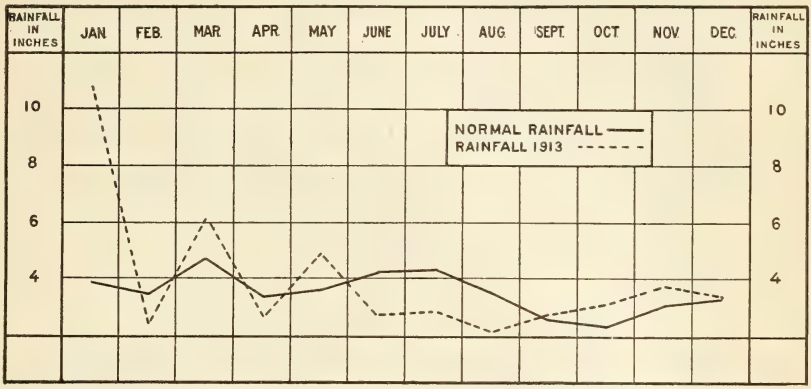

FIG. 6.—Diagram showing comparison of the actual rainfall in 1913 with normal.

SEASONAL DISTRIBUTION OF OPERATIONS.

CROPS.

The farm enterprises[1] found in any well-developed agricultural region are mainly those which the experience of farmers has shown to be profitable. In the process of selecting such enterprises the soil and climate are fundamental factors. Additional limiting factors are a profitable market and the availability of the right kind of labor. Still another factor not so evident as either of these is the way the various enterprises fit in with each other so as to interfere as little as possible. Each crop not only has its peculiar method of cultivation, but also its own peculiar seasons for the various operations required. Not only must a certain amount of labor be given, but this labor usually must be applied within definite seasons. Hence

[1] Definitions: Certain special terms used in this bulletin are defined below:

Farm enterprise.—Any crop or live-stock undertaking on the farm, such as corn, tobacco, beef cattle, or swine.

Labor income.—The amount the farmer receives for his labor and management besides the house rent, food, and other perquisites the farm may furnish. It is found by subtracting current expenses and interest on the total investment in the farm business from receipts.

Animal unit.—The equivalent of a mature farm animal, as a horse, cow, or steer; 7 sheep, 14 lambs, 5 hogs, 10 pigs, 100 poultry, 2 head of young cattle or colts are equivalent to an animal unit.

Labor unit.—A man-day's work of 10 hours.

Power unit.—One day's work of a mule, horse, or the equivalent of this work done by an engine.

Crop index.—A figure that measures the yield of all crops on a farm as compared with the average yield of the community. One hundred is taken as the standard measure of the farm yield of the community.

Diversity index.—A factor derived by reducing all the enterprises of the farm to their equivalent represented by a number of enterprises equal in value. It measures the degree of diversification of enterprises on the farm.

the organization of these enterprises must take into account economy in the distribution of labor. Even though an enterprise like tobacco, for instance, may yield a very large profit per acre, the amount that can be handled profitably on a given farm is limited not only by the amount of good tobacco soil, but by such a relation of the tobacco crop to other established enterprises as will bring about the most advantageous distribution of available labor as well as other advantages of diversity. Figures 7 and 8 show the seasonal distribution of operations required by the crops grown here, and illustrate how the operations are limited as to seasons and are distributed through the year. These diagrams are based on the practice of about 75 farmers for each crop. The black lines indicate the limits of the average of the estimates given and the dotted lines show the limits of the range of these estimates.

LIVE STOCK.

In a manner somewhat similar to crops, live-stock enterprises require special attention at limited seasons of the year, so that in any system of general farming the operations required by them have an important influence in the organization of the farm. In figures 9 and 10 there are shown the principal operations and events occurring in the life of animals on the farm.

TABLE III.—*Labor units and power units required by various enterprises (based on average of about 75 records for each enterprise).*

Enterprise.	Labor units.[1]	Power units.[2]	Enterprise.	Labor units.[1]	Power units.[2]
	Per acre.	*Per acre.*		*Per acre.*	*Per acre.*
Tobacco	38.8	7.7	Meadow hay	1.1	0.7
Corn:			Cowpeas and soy beans	1.8	3.0
Shocked and put into crib	4.6	4.4			
Hogged down	2.4	3.5		*Per animal unit.*	*Per animal unit.*
Wheat	1.2	1.6			
Rye:			Ordinary milch cows on farm	12.3	1.5
Thrashed	1.3	2.0	Dairy cows, including marketing milk	18.3	6.2
Cut and fed as hay	.9	1.3	Beef cattle or general stock cattle	1.0	.9
Pastured	.2	.6	Sheep	2.3	.05
Oats:			Swine	1.1	.02
Thrashed	1.2	1.4			
Fed in bundles	1.2	2.0			

[1] Labor unit: A man-day's work of 10 hours.
[2] Power unit: One day's work by a mule, horse, or the equivalent of this work done by an engine.

LABOR AND POWER UNITS REQUIRED.

The average number of labor units and power units required for each crop and stock enterprise is shown in Table III. These are based on about 25 records obtained in each of the counties studied as previously explained. The farmers' practice relative to the amount of work put upon the crops and live stock is quite uniform throughout the region. The variations that occur are due mainly to weather con-

ditions and conditions of the soil rather than to the individual practice of each farmer. It is believed that the estimate of 50 to 75 farmers will give a very close average for the practice here.

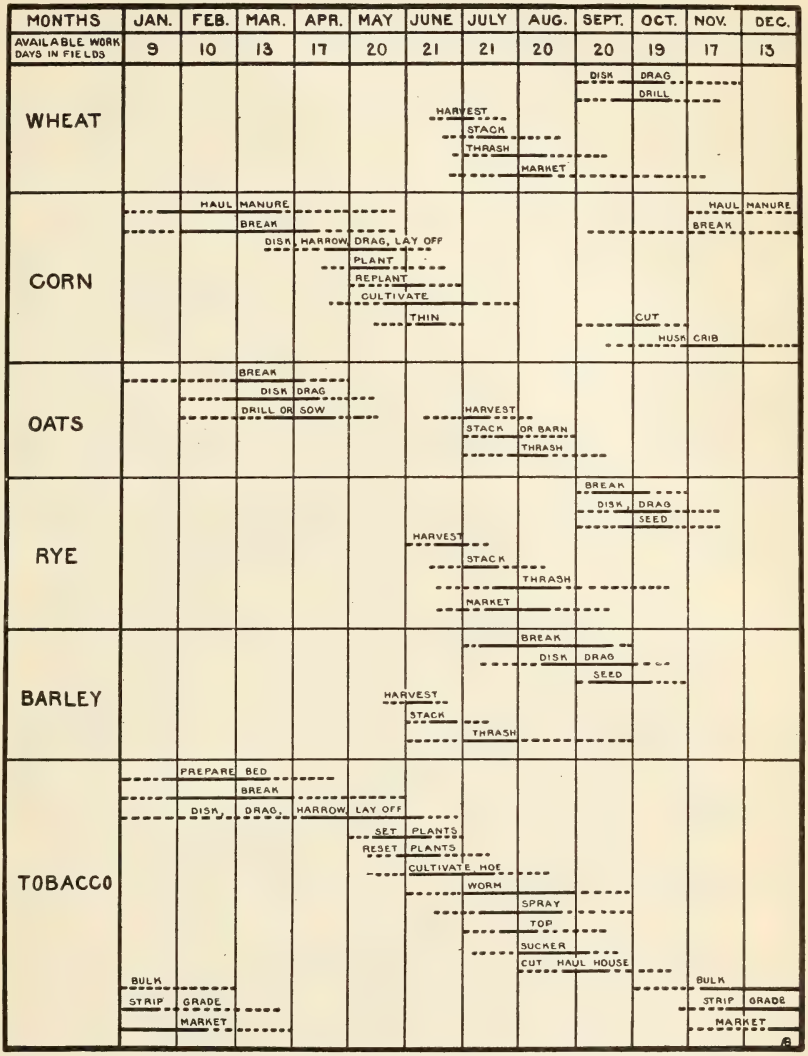

FIG. 7.—Diagram showing the seasonal distribution of labor on intertilled and cereal crops. (Black lines indicate average, dotted lines extreme range.)

The average farm of this region (about 300 acres) furnishes about 900 productive labor units and about 450 productive power units.[1]

[1] By the terms "productive labor" and "productive power" is meant the labor or power applied directly to an enterprise which produces an income, such as a crop or a group of animals, or work which increases the value of the farm, such as building new fences, making new drains, etc. Repair work or mowing down weeds, etc., although necessary, is not regarded as "productive."

CROP YIELDS FOR 1913.

The yields of important crops are given in Table IV. All except corn are above the figures given for the same locality in the census

TABLE IV.—*Average crop yields in Mason, Madison, and Scott Counties for 1913, compared with census figures of 1910.*

Crops.	178 records, 1913.	Census, 1910.	Crops.	178 records, 1913.	Census, 1910.
Corn.....bushels..	34.5	38.8	Rye.....bushels..	9.9	9
Tobacco.....pounds..	1,132	1,063	Hay.....tons..	1.05	1.01
Wheat.....bushels..	16	12.9			

of 1910. The corn crop was undoubtedly cut short by the abnormally low rainfall in June, July, and August, 1913 (see rainfall chart, fig. 6.) Tobacco being a drought-resisting plant, was probably not much affected. The bluegrass pastures, however, were un-

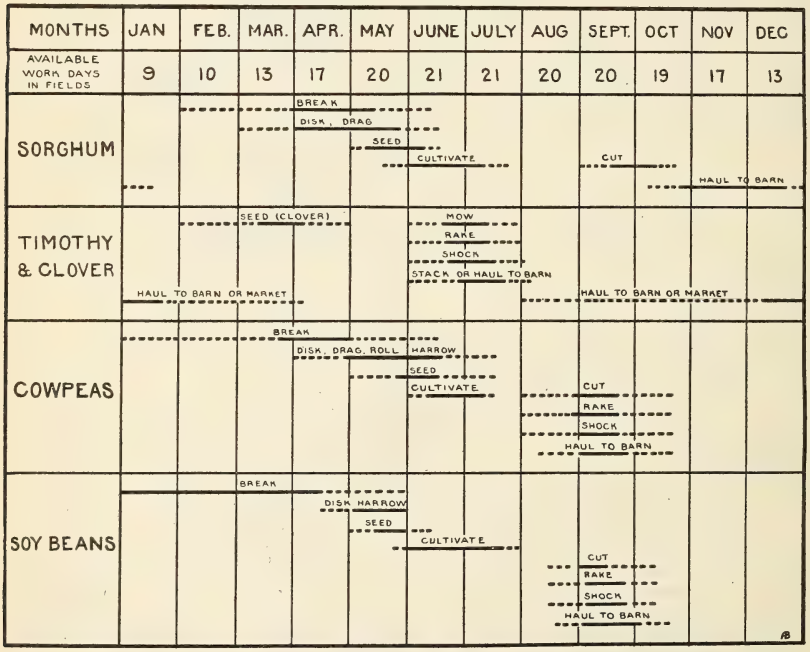

FIG. 8.—Diagram showing the seasonal distribution of labor on forage crops. (Black lines indicate average, dotted lines extreme range.)

doubtedly shorter than usual during this year, and as a consequence some of the farms were unable to support the normal amount of live stock through the summer.

This year was a good one for wheat, which is an early-maturing crop. The fall and winter rains, much above the normal in amount, helped to give it a good start, and a dry harvest period was very

favorable. Since there was sufficient moisture to give tobacco a good start, the dry summer may have been of some advantage to that crop.

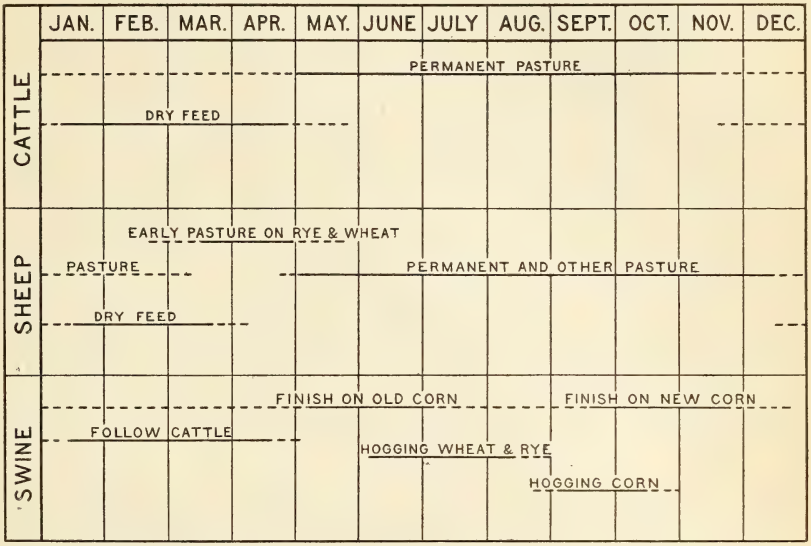

FIG. 9.—Diagram showing the seasonal feeding practice relative to cattle, sheep, and swine. (Black lines indicate average, dotted lines extreme range.)

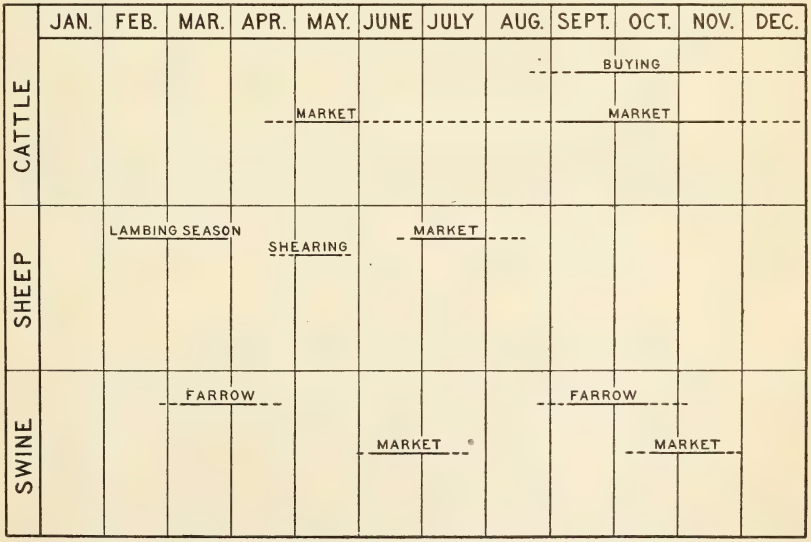

FIG. 10.—Diagram showing seasonal distribution of operations and events other than feeding relative to cattle, sheep, and swine. (Black lines indicate averages, dotted lines extreme range.)

Taking into consideration all factors, this season undoubtedly is fairly representative of an average year.

LAND TENURE AND CROPPER LABOR.

A large majority of the farms here are operated by owners, while most of the tobacco, and, to some extent, corn and other crops, are raised by croppers. These may, however, be regarded as practically laborers, since in most cases the owner or regular tenant of the farm on which the cropper operates has general supervision. In most cases the owner or regular tenant furnishes the work stock and tools and looks after the sales. Receipts from the crops are usually divided equally between the farm operator and the cropper. The cropper as a rule lives on the farm, has the use of a cottage and small garden, and is allowed to pasture a cow or two and a horse, if he owns one. This system gives a little added independence to the laborer and enables him to support a family, the members of which can utilize much of their time to advantage by working in the tobacco fields.

TABLE V.—*Relation of tenure to capital and to rents (averages of 177 bluegrass farms).*

Tenure.	Number of records.	Size of farm.	Total capital.	Investment in real estate.	Investment in working capital.	Land earnings per acre.[1]	5 per cent interest on real-estate value per acre.	Rent paid by tenant per acre.
		Acres.						
Owner farms	130	303	$37,741	$32,645	$5,096	$5.97	$5.39	.....
Owner—additional	27	344	40,056	33,822	6,234	4.22	4.92	[2] $4.70 [3] 12.60
Cash tenant	13	356	36,377	31,483	4,894	5.20	4.42	4.02
Share tenant	7	192	27,455	23,950	3,609	7.62	6.24	7.33
All farms	[4] 177	309	37,991	32,760	5,231	5.34	5.25	5.06

[1] Land earnings are the difference between value per acre of total production and total operating expenses. Total production includes the value of all crops sold, fed to live stock, and used by the family; also value of all live-stock products and net receipts from live stock sold. Operating expenses are all current expenses including value of products consumed and operator labor and management, but not interest on real-estate value.
[2] Cash.
[3] Share.
[4] One additional farm operated by a manager.

Table V shows the farms grouped on the basis of tenure. One hundred and thirty out of 177, or about 74 per cent, of the farms included in this study are owner farms. It is interesting and instructive to compare in this table the land earnings with the rental value of the land, which is here assumed to be 5 per cent on the real-estate investment. The average of all farms in the group earns but 9 cents per acre more than 5 per cent on the average estimated acre value of real estate. The average tenant pays $5.06 per acre rent, which is but 19 cents less than the interest at 5 per cent. Some farmers fail to clear as much as fair interest on the land investment; others clear much more, but the average is not far from 5 per cent

on investment. If all the farmers were found to be making more than the current rate of interest on their valuation of the land the tendency would naturally be toward an increase in land values and a rise in rents. The farmers in this section have evidently valued their land approximately on the basis of its real earning capacity.

The fact that the average farmer in the group studied had left, after counting out all operating expenses, just about enough to pay interest on his land investment does not indicate that the farmer is not making money. On the other hand, it may indicate quite the opposite. In arriving at the remainder left for interest the average farmer is allowed fair wages for his services as manager and his family is allowed common wages for the work they do. In addition, the family have a home and a large percentage of their food free of money cost and a fair rate of interest on the working capital invested. In the case of a large number of farmers in the region equal comfort in the home and its surroundings and equal opportunity for outdoor recreation could not be afforded in the city except by the more wealthy. These advantages have a real value, but they evidently have not been capitalized by the farmers who gave the records.

A few farmers during the year made comparatively large profits, while a few suffered large losses, the main reasons for which will be pointed out in the following pages. The large majority, however, could live in comfort and lay aside something in the bank.

It will be noticed that cash tenants pay less rent than do those who rent on shares. There would naturally be a certain difference in favor of the cash tenant, since usually the landlord would rather rent at a lower rate for cash than for a share of the crop; but the large difference shown in the table is due principally, no doubt, to the fact that most of the share-rented land is in relatively small areas and much of it is devoted to tobacco, one-half of which is turned over to the owner. On the other hand, cash-rented land is in large areas and devoted more largely to pasture.

IMPORTANCE OF SIZE OF FARM.

The farms vary greatly in size. The smallest farm had 35 acres, the largest 5,000. This factor more than any other seems to determine their organization, as the following analysis will show:

RELATION OF SIZE OF FARM TO DISTRIBUTION OF RECEIPTS.

In Table VI it will be seen that the small-sized farms get most of their receipts from crops, while the large farms get most of their income from live stock. Small farms have the largest percentage of receipts from tobacco. This crop decreases in relative importance as the farms increase in size.

TABLE VI.—*Relation of size of farm to receipts from crops and live stock.*

Range.	Number of records.	Average size.	Per cent receipts from all crops.	Per cent receipts from tobacco.	Per cent receipts from live stock.
		Acres.			
100 acres or less	19	73	63	44	34
101 to 200 acres	48	156	58	37	41
201 to 300 acres	51	251	56	34	43
301 to 500 acres	33	382	50	30	49
501 to 700 acres	15	571	48	25	50
Over 700 acres	12	1,020	43	19	55
All farms	178	310	55	34	44

RELATION OF SIZE OF FARM TO DISTRIBUTION OF CROPS.

The percentage area in crops decreases and the percentage area in pasture increases as the size of the farm becomes larger, as shown in Table VII. This relative variation is consistent with the facts brought out in Table VI, since the increase in percentage area in pasture would mean more live stock and thus a higher percentage of receipts from this source. The percentage area in tobacco is largest on the small farms. The small farmer increases the size of his business by this means. More labor is thus employed per acre and a greater income realized. In the case of other crops the size of the farm apparently affects the distribution but little.

TABLE VII.—*Percentage distribution of farm area in various crops (farms grouped on the basis of size).*

Size of farm.	Number of records.	Per cent of farm area in crops.	Per cent of farm area in pasture.	Per cent of farm area in corn.	Per cent of farm area in tobacco.	Per cent of farm area in wheat.	Per cent of farm area in other cereals.	Per cent of farm area in hay and mixed forage.
100 acres or less	19	56	39	41	15	13	13	14
101 to 200 acres	48	58	41	32	11	26	10	19
201 to 300 acres	51	42	54	36	10	23	13	17
301 to 500 acres	33	44	53	35	9	23	16	15
501 to 700 acres	15	46	53	39	8	23	16	13
Over 700 acres	12	35	59	40	7	23	14	14
All farms	178	47.9	48.9	36	9	24	14	15

RELATION OF SIZE OF FARM TO DISTRIBUTION OF LIVE STOCK.

Cattle predominate among the live-stock enterprises, an average of 60 per cent being of this class, and about this percentage distribution is maintained on farms of all sizes, excepting farms over 700 acres in size, which show 75 per cent of animal units in cattle. These facts are shown in Table VIII. Steers predominate on the larger farms, while a larger percentage of cows and young stock are kept on the smaller farms. The distribution of other kinds of animals is not influenced in any important way by the size of the farm. The fact, however, that all farms have about the same amount

of poultry makes the percentage amount kept on small farms much larger than on large farms.

TABLE VIII.—*Percentage distribution of different classes of animal units.*

Size of farm.	Number of records.	Per cent cows and young stock.	Per cent steers.	Per cent total cattle.	Per cent horses and mules.	Per cent sheep.	Per cent swine.	Per cent fowls.
100 acres or less	19	24	39	65	7	3	19	6
101 to 200 acres	48	26	26	52	6	10	26	6
201 to 300 acres	51	22	35	56	5	15	20	4
301 to 500 acres	33	14	48	61	6	11	20	2
501 to 700 acres	15	12	50	62	6	12	18	2
Over 700 acres	12	11	64	74	2	6	17	1
Tota averages	178	16	44	60	5	11	20	4

RELATION OF SIZE OF FARM TO CAPITAL AND INCOME.

Table IX shows the amount of capital invested on farms of various sizes, and shows also the farm income and labor income. The farm income increases with the size. The labor income similarly increases with the size of the farm. There is an exception in the group of farms of from 301 to 500 acres. There falls into this group a large number of farms classified as "general mixed farms" (see p. 18), which stand between the types specializing in either tobacco or live stock, and which are the least efficient of all types. (See also Table X.)

TABLE IX.—*Capital and incomes on farms of different sizes.*

Size of farm.	Number of records.	Average size of farm.	Total capital invested.	Investment in real estate.	Investment in working capital.	Farm income.	Labor income.
		Acres.					
Less than 100 acres	19	73	$12,502	$10,338	$2,164	$1,083	$473
101 to 200 acres	48	156	21,241	18,203	3,038	1,537	518
201 to 300 acres	51	251	30,697	26,548	4,149	2,015	595
301 to 500 acres	33	382	48,618	41,856	6,762	2,554	299
501 to 700 acres	15	571	75,836	66,612	9,224	4,809	1,542
Over 700 acres	12	1,020	97,009	82,952	14,057	6,504	2,130
All farms	178	310	37,793	32,585	5,208	2,419	686

TABLE X.—*Relation of size of farm to utilization of labor, power, and machinery.*

Size of farm.	Number of farms.	Per cent of available time utilized by man labor.	Per cent of available time utilized by work stock.	Cost of work stock per power unit.	Cost of machinery per power unit.
Less than 100 acres	19	78	27	$2.68	$0.46
100 to 200 acres	48	95	28	1.84	.35
201 to 300 acres	51	87	33	1.54	.21
301 to 500 acres	33	84	33	1.78	.17
501 to 700 acres	15	80	37	1.36	.13
Over 700 acres	12	80	48	1.18	.07

TABLE XI.—*Relation of size of business (measured by operating expenses) to labor income.*

Operating expenses.	Number of records.	Farm area.	Average operating expenses.	Value of total production.	Labor income.
		Acres.			
$3,000 or less	48	143	$2,236	$2,955	$323
$3,001 to $5,000	63	234	3,785	4,932	548
$5,001 to $7,000	30	320	5,787	7,651	786
Over $7,000	37	648	10,022	13,461	1,393
All farms	178	310	5,001	6,630	686

RELATION OF SIZE OF BUSINESS TO LABOR INCOME.

The size of the farm in this region is an unreliable measure of the size of the farm business, owing to the fact that many farms with a comparatively small arceage have a larger business than is conducted on farms much larger in area. The operating expenses, however, give an approximately accurate measure of the size of business. In Table XI, showing the relation of the size of business to labor income, the farms are sorted into groups on the basis of operating expenses. It will be observed that the labor income increases with the size of business.

TYPES OF FARMS.

Table XII shows the farms grouped on the basis of type.[1] Judging from the mere outward appearance of all the farms studied, except the 10 dairy farms, there would seem to be one general type of farm. All raise about the same crops and handle about the same classes of live stock. The differences lie in the relative percentage of receipts from live stock, tobacco, and other crops, which affects the organization and thus distinguishes specific types. The stock farms require less labor in proportion to size of business and to size of farm than farms of the tobacco or the dairy type. Stock farming, to be profitable, requires relatively a large amount of capital invested in live stock and less per acre in land. Tobacco, on the other hand, is a highly specialized enterprise, requiring a large amount of labor per acre of crops and yielding much greater returns per acre than live stock. (See Table XII.)

[1] The tobacco type includes all farms that have 50 per cent or more of their receipts from tobacco, with not over 30 per cent from any one other source.

Tobacco-stock farms have 75 per cent or more of their receipts from tobacco and live stock combined, the income from neither being below 30 per cent.

The general mixed type includes all farms that do not fall into any of the other types.

Stock farms with tobacco have 50 per cent or more of their receipts from live stock, with not over 30 per cent from any one other source.

Stock farms with no tobacco have 50 per cent or more of their receipts from live stock, but grow no tobacco.

Dairy farms have 50 per cent or more of their receipts from dairy products.

TABLE XII.—*Showing the grouping of farms on the basis of type, the size of farm, the distribution of capital, and the labor income of each.*

Type of farm.	Number of records.	Average size of farm.	Total capital per farm.	Real estate per farm.	Working capital per farm.	Labor income per farm.
		Acres.				
Tobacco	31	171	$24,693	$21,729	$2,964	$503
Tobacco stock	61	300	34,841	30,069	4,772	778
General mixed	36	328	43,198	38,540	4,658	471
Stock with tobacco	31	367	45,613	38,468	7,145	1,202
Stock with no tobacco	18	457	44,148	35,603	8,545	994
Dairy	10	163	22,494	17,732	4,762	1,931
All farms	187	310	37,793	32,585	5,208	686

Tobacco, of course, occupies relatively but a small part of the area even of the tobacco farms, while pasture occupies from one-third to more than one-half of the farm area on the stock farms. (See figs. 11 and 12.)

RELATION OF TYPE OF FARM TO EFFICIENCY.

In Table XIII an important point to be observed is the relation between land earnings and 5 per cent interest on land values, which may be regarded as rent. The average of each type, except the general mixed type, is making something above operating expenses. The average of all farms shows almost a balance between land earnings and rent. The dairy type shows the highest profits and highest efficiency. This type is limited in its development, however, since it depends for marketing its product on the local towns and cities. The type not thus limited in its development which shows the highest efficiency is the stock-with-tobacco type. With the exception of the dairy farms, this type had the highest percentage of farms making over $500 labor income. The general mixed farms had the lowest efficiency and the lowest percentage of farms making this amount of labor income.

TABLE XIII.—*Relation of type of farm to efficiency.*

Type of farm.	Number of records.	Value of total production per acre.	Operating expense per acre.	Land earnings per acre.	5 per cent interest on land value.	Per cent of farms with over $500 labor income.
Tobacco	31	$28.40	$22.50	$5.90	$6.35	50
Tobacco stock	61	24.80	19.50	5.30	5.00	50
General mixed	36	22.14	17.11	5.03	5.90	36
Stock with tobacco	31	28.20	19.70	8.50	5.25	58
Stock with no tobacco	18	16.97	12.60	4.37	3.90	55
Dairy	10	47.88	28.82	19.06	5.45	70
Average of all	187	21.40	16.06	5.34	5.25	49

RELATION OF TYPE OF FARM TO UTILIZATION OF PASTURE.

According to results shown in Table XIV, the dairy type of farm would seem to utilize pasture most efficiently. This, however, is not necessarily true. The apparent efficiency of that type may be ex-

FIG. 11.—Typical tobacco field. Even on the tobacco farms tobacco occupies a relatively small part of the farm area.

plained by the fact that dairy farms depend on silage and concentrated feeds in addition to bluegrass pasture, while the other types of farms mostly "rough" the young cattle and steers through the winter and depend entirely on bluegrass to put on growth and fat during the summer. This system would necessarily require more acres of pasture per animal unit than the dairy system. It will be observed, however, that the stock-with-tobacco type utilizes pasture area more efficiently than any of the other common types.

TABLE XIV.—*Relation of type of farming to utilization of pasture area.*

Type of farm.	Number of records.	Crop index.	Farm acres per animal unit.	Pasture acres per animal unit.
Tobacco	31	93	10	4.3
Tobacco, stock	61	96	6	3.3
General mixed	36	99	8	3.7
Stock with tobacco	31	102	5	2.7
Stock with no tobacco	18	113	6	3.6
Dairy	10	99	3	1.8

The renting value of land, as shown in Table XIII, would indicate that with the exception of the stock-with-no-tobacco type the land

should be similar in quality. The stock-with-no-tobacco type of farm is the largest in area and usually much of the pasture land is hilly and of poor quality, hence would not be expected to utilize pasture area as efficiently as could be done on lands better in quality and higher in

FIG. 12.—Typical bluegrass pasture. Bluegrass occupies from one-third to more than one-half of the farm area on the stock farms.

price. The tobacco farms and the "general mixed" farms would seem to have higher quality of land, yet there is comparatively low efficiency in the utilization of pasture area. These types specialize on crops and apparently have neglected to utilize fully pasture land.

RELATION OF TYPE OF FARM TO CROP YIELD.

Table XV shows for the year 1913 the yield of various crops in the region.

TABLE XV.—*Average yield of crops on farms of various types.*

Type of farm.	Number of records.	Yield of corn.	Yield of tobacco.	Yield of wheat.	Yield of rye.	Yield of oat hay.	Yield of hay.
		Bushels.	*Pounds.*	*Bushels.*	*Bushels.*	*Tons.*	*Tons.*
Tobacco	31	30.5	1,196	17.7	9.1	0.67	1.09
Tobacco stock	61	33.1	1,112	14.5	10.0	.94	1.06
General mixed	36	30.6	1,093	17.0	10.4	1.26	1.12
Stock with tobacco	31	36.6	1,192	15.0	10.3	1.40	.93
Stock with no tobacco	18	44.2	.....	14.5	7.14	.88	.85
Dairy	10	29.6	1,054	19.6	.....	.....	1.10
All farms	187	34.5	1,132	16.0	9.9	1.06	1.05

As is pointed out in Table IV, page 12, the corn crop was cut short by drought. The corn crop is important in proportion to

the amount of live stock kept. The stock-with-tobacco and the distinctly stock types show higher yields than other common types. The fact that the dairy farms show a low yield of corn can not be explained unless by the fact that the records were few. The crop index would show that the productiveness of the farm increases with increasing importance of live stock and decreases with increasing importance of tobacco.

IMPORTANCE OF RIGHT AMOUNT OF LIVE STOCK ON THE FARM.

The fact that about half of the area of these farms is kept in bluegrass pastures makes the full utilization of such pasture a matter of great importance. The relation that this bears to efficiency is shown in Tables XVI and XVII.

TABLE XVI.—*Relation of utilization of pasture area to efficiency.*

Pasture per animal unit.	Number of records.	Average number acres of pasture per animal unit.	Average farm acres per animal unit.	Feed cost per animal unit.[1]	Labor income.
2 acres or less	42	1.4	4	$31	$1,114
2.1 to 3 acres	49	2.5	5	37	960
3.1 to 4 acres	38	3.6	9	38	711
4.1 to 5 acres	17	4.4	8	45	311
Over 5 acres	25	7.0	10	58	−93

[1] The feed cost here calculated included the value of pasture, which ranged from $2.25 to $5 per acre and averaged about $3.50 per acre.

TABLE XVII.—*Relation of farm acres per animal unit to crop index and labor income on 121 farms similar in type.*

Farm acres per animal unit.	Number of records.	Average acres per animal unit.	Size of farms.	Value of land per acre.	Crop index.	Labor income.
			Acres.			
Less than 4 acres	17	3.1	219	$138	115	$1,381
4 to 5.4 acres	36	4.8	294	111	108	1,006
5.5 to 6.9 acres	28	6.1	303	106	100	393
7 to 8.9 acres	26	7.6	305	115	98	256
Over 9 acres	20	12.0	354	109	100	−214

In the first of these tables is shown the relation of acres of pasture per animal unit to labor income, in the other the relation of farm acres per animal unit to these factors. The group of farms most heavily stocked has also the highest priced land and shows the highest crop index. This fact may explain why this particular group was able to stock most heavily. The other groups, however, do not show any marked difference in respect to the quality of the land, as shown by the values given and the crop index, and it would naturally be expected that each would show about the same efficiency in the utilization of pasture area. The failure to maintain efficiency in this regard has evidently been an important factor in

lowering general efficiency and thus labor incomes. The farms that have labor incomes below $500 almost invariably show a poor utilization of pasture area.

It will be observed in Table XVI that the group of farms which furnishes over 5 acres of pasture for each animal unit have nearly twice the feed cost per farm as the group that furnished but 2 acres or less. This increased feed cost would necessarily follow where the acreage used by each animal unit increased with no decrease in the cost per acre of pasture. The group of farms showing lowest efficiency in the utilization of pasture area was only slightly lower in general quality than the preceding group and about the same quality as the third group, as indicated by the value of the land.

CROP YIELD AN IMPORTANT FACTOR IN EFFICIENCY.

A factor of prime importance to profitable farming on these farms is the crop yields. In Table XVIII is shown the relation of crop yield to labor income and farm efficiency. The yield of all crops is reduced to a crop index, as explained on page 22, 100 representing the average yield for all the farms giving records. Labor income increases directly as the average index of yield of the different groups increases. It is, of course, possible to secure high yields of crops at too great expense, but there is no indication that any of the farms studied here made any error on this point. Practically no commercial fertilizer was used. The common method of utilizing manure from animals would generally be regarded as wasteful.

TABLE XVIII.—*Relation of crop yield to labor income.*

Crop index.	Number of records.	Size of farm.	Labor income.
		Acres.	
90 or less	35	303	$217
91 to 100	37	297	519
101 to 110	47	273	701
111 to 120	30	362	1,080
Over 120	29	341	1,103

About 65 records were taken on methods of keeping up fertility. These showed that the average farmer hauled to the fields about 14 per cent of the manure produced on his farm. In this section, however, feed for live stock is generally hauled to the pastures and scattered about on places needing manure. In this way a great deal of manure is returned to the soil. It is estimated that about 50 per cent of the manure produced on these farms is utilized in keeping up soil fertility. The rest is wasted.

RELATION OF DIVERSITY TO PROFITABLE FARMING.

The principal advantages which diversity may secure are: (1) The adaptation of enterprises to the physical conditions of the farm as in cases where parts of the area are hilly or stony or where there are differences in soil; (2) the maintenance of soil fertility, as effected by having a legume in the rotation, or a blue-grass sod; (3) the profitable distribution of labor (other things equal, the system that utilizes available labor best has the advantage); (4) adaptation to market conditions. Market prices fluctuate often to the extent of causing serious loss where attention is centered on any one enterprise. Diversity steadies the income of the farm and makes it more dependable.

TABLE XIX.—*Relation of type of farm to diversity.*

Type of farm.	Number of records.	Per cent receipts from crops.	Per cent receipts from livestock.	Per cent receipts from tobacco.	Diversity index.
Tobacco	31	80	19	65	2.3
Tobacco stock	61	55	44	43	3.4
General mixed	36	68	31	27	4.6
Stock with tobacco	31	37	59	21	4.1
Stock with no tobacco	18	18.3	81	.....	2.8
Dairy	10	12	87	7	2.0

Diversity is closely related to the size of farm. In the bluegrass region it would not be profitable even on the larger and cheaper farms to have all of the farm area in bluegrass, neither would it be profitable on small, high-priced farms to cultivate the entire area in tobacco. Through long experience the farmers have arrived at a distribution which, on the whole, has proved profitable under the conditions prevailing. (See Table VII.)

The degree of diversity varies on different types of farms, as shown in Table XIX. Here it will be observed that the tobacco type and the stock type have the lowest diversity, while the intermediate types have the highest diversity. The tobacco and the stock type each emphasizes a single enterprise. The typical tobacco farm is relatively small in size, and in order to have a business of adequate magnitude the percentage of crop area in tobacco must be relatively large and the pasture area relatively small. A small area of pasture tends to decrease the receipts from stock. On the other hand, the distinctly stock farm is relatively large in size, has a poorer quality of soil, and is cheaper in price per acre than farms of other types. Usually the topography is quite rolling and sometimes it is stony, a condition which is a handicap in tillage. In such cases it is more advantageous to leave a large proportion of the area in pasture and to till only the more level and more productive land.

Table XX shows the diversity that corresponds to highest efficiency on each type of farm. It is evident from this table that there could be no general increase in efficiency through increase in diversity, since the diversity which gives highest efficiency is about equal to the average for each type. There is as much liability to lose through overdiversity as through underdiversity. The average farm of each type has no doubt about the diversity it should have.

TABLE XX.—*Showing the diversity index that corresponds to maximum efficiency on various types of farms.*

Type.	Number of records.	Size of farm.	Diversity index corresponding to highest efficiency.	Average diversity
		Acres.		
Tobacco	31	174	2.4	2.3
Tobacco stock	61	344	4.6	3.4
General mixed	36	256	3.8	4.6
Stock with tobacco	31	316	3.6	4.1
Stock with no tobacco	18	683	2.0	2.8

COST OF PRODUCTION.

In Table XXI are shown the average unit value and cost of production for several important enterprises. In arriving at these figures every item of expense, including the cost of operator's labor and management and of rent has been counted. Values have been determined by current market prices.

TABLE XXI.—*Unit cost and value for several important enterprises on the different types of farms for the year 1913.*

Type of farm.	Number of records.	Corn, per bushel.		Tobacco, per pound.		Wheat, per bushel.		Rye, per bushel.		Meadow hay, per ton.		Productive live stock, animal unit basis.	
		Cost.	Value.	Cost.	Value.	Cost.	Value.	Cost.	Value.	Cost.	Value.	Cost.	Value
Tobacco	31	$0.76	$0.76	$0.113	$0.118	$0.73	$0.98	$1.33	$0.84	$16.67	$16.06	$48.51	$42.40
Tobacco stock	61	.71	.76	.123	.119	.88	.98	1.04	.84	16.00	16.06	39.75	47.66
General mixed	36	.73	.76	.130	.116	.75	.98	1.01	.84	15.27	16.06	47.92	47.73
Stock with tobacco	31	.65	.76	.120	.117	.84	.98	1.01	.84	18.94	16.06	44.86	54.93
Stock with no tobacco	18	.64	.76	.....	.....	.98	.98	1.22	.84	22.50	16.06	41.96	53.49
Dairy	10	.81	.76	.127	.104	.68	.98	.....	.84	18.16	16.06	66.24	100.88
Av. of all	187	.68	.76	.127	.118	.80	.98	1.05	.84	17.75	16.06	44.41	52.55

The enterprises are usually so dependent on each other, and their place in the farm organization so related to the utilization of labor and to other factors, that the distribution of costs is a difficult matter. In fact, no system has as yet been devised which can be said to make this distribution in any but an approximately correct man-

ner.[1] The reader must keep in mind the fact that the figures given in the table apply only to the average farm of each type, and that while some farmers are selling the crop at below the cost of production, others get much more than the cost. Farming may be said to be profitable when the operating costs, rightly interpreted, about equal the returns, since the costs include pay for the farmer's labor and services as manager, allowance for family labor, current rate of interest on working capital, and rent for his land, if he is an owner. Then, too, he is insured employment for himself and family, and a fair rate of interest on a secure investment. Also, if the farm is rightly organized and its fertility well maintained, it will tend to increase in value. A comparison of the cost and value per pound of tobacco on the average of 187 farms illustrates these facts. Included in the cost of one acre of this crop are $92.69 for labor and management, $11.36 for horse labor, $1.05 for fertilizer, $2.38 for miscellaneous costs, and $34.73 for rent. This value for rent is the average estimated cash amount which the landlord should get for the use of the land for tobacco. The average cost per pound, on this basis, is shown to be slightly above the average price received. The crop, nevertheless, may be regarded as a profitable one for the reason that it employs labor almost continuously throughout the year and it may be depended on for a reliable income. It gives the owner a high rent for his land rather than the relatively low rent which he would have to accept for its use for other crops.

The values of all crop enterprises, except wheat and tobacco, are based on prices of imported products. Oats, corn, hay, and rye are consumed by stock, and during parts of the year these products are shipped in to supply deficiency. The cost of hay and of all other products includes the hauling to market.

Live stock does not seem to be profitable on the tobacco or the mixed type of farms. These types emphasize crops, especially tobacco, and evidently neglect live stock.

In general it is the aim of farmers in this region to raise just enough hay to supply the needs for live stock. It is not a profitable

[1] The costs as shown in Table XXI were distributed to each enterprise in the following manner:

Labor costs were distributed in proportion to the number of labor units required by each enterprise (see Table IV). "Cash to run farm" was distributed in the same way.

Power costs were distributed in proportion to the power units required by each enterprise (see Table IV). Machinery costs were distributed in the same way.

Rent charges included interest on fixed capital, such as buildings, fences, etc. The renting value of land on the average farm was about $5 per acre. Land used for general crops, such as corn, wheat, rye, pasture, including bluegrass pasture, was shown to have a uniform renting value on each farm, ranging from $2.25 to $6 per acre. The average rent for pasture land was $3.50 per acre; for general crop land, about $3.60. Renting value given for tobacco land ranged between $25 and $75 per acre, the average being about $35.

Live stock was charged for feed, including pasture, at farm prices. Six dollars and fifty cents was credited to each animal unit for manure and the same amount charged to field crops in proportion to acreage. Six per cent interest was charged on investment in live stock and an allowance made for depreciation.

crop to market. On the basis of present yields it would probably not pay to market corn.

The growing popularity of the practice of "hogging-down" wheat illustrates how the farmer aims at the organization of enterprises in such a way as to obtain maximum profit. If hogs can be turned into the wheat field there is saved the harvesting, thrashing, and hauling of wheat to market. The labor saved may be utilized in other ways. Then, if the gains on hogs are adequate, it is often possible to get more out of the wheat crop than by harvesting and thrashing it, as is usually done. Winter cover crops, such as wheat and rye, may be judiciously pastured in fall, winter, or spring, and may thus add to the profits of the farm. Bluegrass pastures are often stripped for the seed, and in this way profits from pasture land

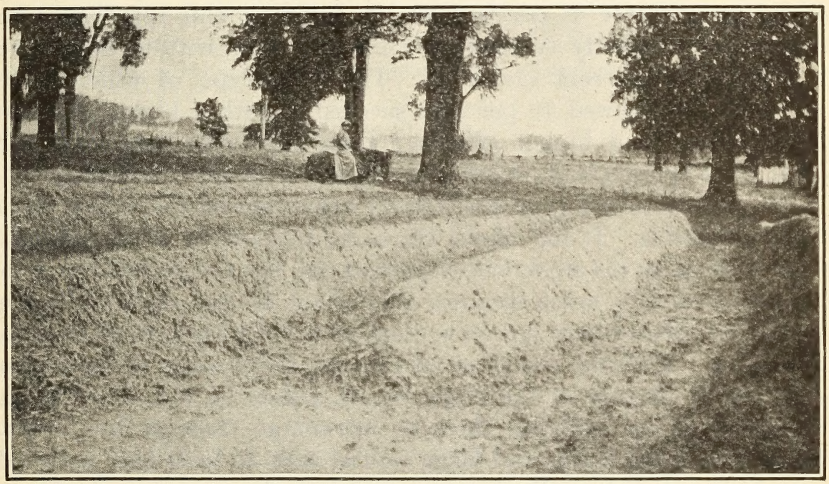

FIG. 13.—Bluegrass seed in process of curing.

are increased. (See fig. 13.) It was noticeable that the most successful group of farms had a relatively large percentage of such forage crops as sorghums, peas, and beans, which were substituted for a part of the area devoted to hay, which is shown to be an unprofitable crop.

On the whole, the average farmer of the region seems to be raising the various crops in about the right proportion for a profitable business.

THE PRIME FACTORS IN PROFITABLE FARMING.

The factors that stand out as important in profitable farming in the localities surveyed are (1) size of business, (2) utilization of pasture area, (3) crop yields, (4) type of farm.

Underlying and closely related to size of business and type of farm are the factors of diversity, utilization of man and horse labor, distribution of crops and live stock from the standpoint of the advantageous utilization of field crops and pasture area, and the distribution of capital.

The farmer may increase the size of business either by buying or renting more land or by increasing the acreage of tobacco, an intensive crop. There are many farms 300 to 500 acres in size which do not show as large a business as many other farms 100 to 200 acres in size which have a relatively large percentage of area in tobacco and a relatively small percentage of area in bluegrass. The tobacco crop furnishes work for a large number of laborers and the returns per acre are correspondingly large.

The type of farm that does not seem to pay here is the general mixed type. Only 34 per cent of the farms of this type could be counted as distinctly successful, while the stock-with-tobacco type had about 58 per cent successful. The dairy type, of which there were only 10, showed 70 per cent successful, with a higher average labor income and higher efficiency than any other type. Of the other three types, about 50 per cent of the farms were successful.

The general mixed type is evidently organized on the wrong basis to be profitable. It has about the same proportion of its receipts from tobacco as the stock-with-tobacco type, but the percentage area in tobacco is very much smaller, only about 4.4 per cent, while the stock-with-tobacco type has an average of about 8 per cent of its area in tobacco. With the exception of tobacco, there seems to have been a failure to dispose of the crops raised, either by marketing them profitably or by utilizing them to advantage through live stock. Many with large farms and large capital seem to have been satisfied with bare interest on their investment, which was adequate for a comfortable living. These men made no effort to make the farm a business success. The tobacco area and much of the area of other crops on such farms was in most cases cultivated by cropper labor, which relieves the owner of much responsibility.

Profitable farming here hinges primarily upon keeping a proper balance between field crops and bluegrass, which is especially adapted to the soil and is a great factor in keeping up its fertility and putting it into a favorable condition for other crops, especially tobacco.

The soil of the bluegrass region is a heavy clay loam with a sticky clay subsoil. It should not be worked when in a wet condition, and during the naturally dry summers and fall it is difficult to plow. To emphasize field-crop farming it would be necessary to plant and work the soil more or less during the whole of the growing season. In the areas of the black loamy soils of the Middle West this usually

can be done with little difficulty, but in this region the nature of the soil would be a serious handicap in such a practice and would put the district at an economic disadvantage if it were not that it is so well adapted to a crop like bluegrass (which loosens up a heavy clay soil) and to an intensive crop like tobacco, which yields a comparatively large income per acre.

The hilly, less productive, and cheaper lands can be organized more profitably as distinctly stock farms, with little or no tobacco. As a rule, however, the farmer must raise some tobacco to meet the requirements of labor.

The farmer who can command but a small area of land should, in order to make his farm most profitable, specialize in tobacco or, where market conditions permit, in dairying. On farms of from 260 to 360 acres in size the best results can be obtained by organizing on the basis of the stock-with-tobacco type, which emphasizes live stock but cultivates an area in tobacco large enough to utilize labor resources to advantage and to secure the advantage of diversity.

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